

Claims

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A drive arrangement for the drive of attached implements for a vehicle, particularly an agricultural or industrial utility vehicle having a combination gearbox, a first electrical machine and a power take-off shaft, a gearbox interface of the combination gearbox is driven by an internal combustion engine and where the first electrical machine is connected with a second gearbox interface of the combination gearbox, wherein the power take-off shaft is connected with a third gearbox interface of the combination gearbox.
2. A drive arrangement according to claim 1, wherein the combination gearbox is provided with a planetary gearbox.
3. A drive arrangement according to claim 1, wherein a second electrical machine is provided that can be driven directly or indirectly by the internal combustion engine.
4. A drive arrangement according to claim 3, wherein the first electrical machine and the second electrical machine can be operated as a generator.
5. A drive arrangement according claim 3, wherein the first electrical machine and the second electrical machine can be operated as electric motors.
6. A drive arrangement according to claim 4, wherein a brake is provided with which the power take-off shaft can be stopped.

7. A drive arrangement according to claim 6, wherein a rectifier is associated with each of the first electrical machine and the second electrical machine so that each of the electrical machines can be switched in both directions of rotation and both directions of torque.

8. A drive arrangement according to claim 7, wherein a control arrangement controls the internal combustion engine, the first electrical machine, the second electrical machine, at least one rectifier and the brake.

9. A drive arrangement according to claim 8, wherein data of the condition of the internal combustion engine, of the power take-off shaft, of the first electrical machine and the second electrical machine can be detected by the control arrangement by way of sensors.

10. A drive arrangement according to claim 8, wherein when the brake is released, the first electrical machine, the second electrical machine and the combination gearbox can be combined to an infinitely variable torque division gearbox for the power take-off shaft.

11. A drive arrangement according to claim 10, wherein the second electrical machine can be operated as a generator and the first electrical machine can be operated as an electric motor.

12. A drive arrangement according to claim 8, wherein the control arrangement controls the first electrical machine and, if necessary, the second electrical machine in such a way that at least one optimizing goal stored in a memory of the control arrangement as input can be reached.

13. A drive arrangement according to claim 8, wherein the control arrangement controls the first electrical machine and, if necessary, the second electrical machine in such a way that torsional vibrations in a power take-off shaft driveline can be dampened.

14. A drive arrangement according to claim 8, wherein the transmission of the combination gearbox is designed in such a way that rotational speeds required in a principal operating region of the power take-off shaft lie in a rotational speed region of the internal combustion engine with optimum efficiency, and that a minimum proportion of the power output of the first electrical machine or the second electrical machine must be made available.

15. A drive arrangement according to claim 8, wherein the torque of the power take-off shaft can be determined on the basis of the torque generated by the first electrical machine.

16. A drive arrangement according to claim 4, wherein the first electrical machine and the second electrical machine are arranged close to each other in space, so that both electrical machines can be cooled by one cooling arrangement.

17. A drive arrangement according to claim 4, wherein the first electrical machine and the second electrical machine each operate as generators and supply an electrical device.

18. A drive arrangement according to claim 1, wherein a spur gear stage is provided between the power take-off shaft and the third gearbox interface and is configured so that it can be shifted between two different rotational speeds of the power take-off shaft.

19. A drive arrangement according to claim 8, wherein a rotational speed control of the power take-off shaft is provided as a function of a speed of the vehicle.

20. A drive arrangement according to claim 19 wherein the first electrical machine and the second electrical machine are configured for the braking of the vehicle, particularly for steady braking.

21. A drive arrangement according to claim 20, wherein the vehicle is provided with at least one vehicle wheel driven by an electric motor and the electrical energy generated by the electrical machine and/or the further electrical machine supplies the electric motor of the vehicle wheel.

22. A drive arrangement according to claim 21, wherein during a pure propulsion operation of the vehicle the power take-off shaft is stopped by the brake.